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WORK STATUS REPORT

JS-508

Period: July 1 through July 31, 1967

MICRODENSITOMETER SUPPORT

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August 8, 1967

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INTRODUCTION

This progress report covers the period from 1 July through 31 July 1967. The financial information included in this report is for the entire contract period from 2 November 1966 through 30 June 1967.

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PROGRESS DURING THE PERIOD

Color Image Assessment - Analytical Aspects

The programming has been completed for the matrix determination of cyan, magenta and yellow analytical densities from integral red, green and blue filter densities. This routine will be used in edge analysis and MTF evaluation of color emulsions as it allows one to work with individual dye layers.

The ensemble averaging computer program has also been completed and tested. This program automatically averages over a specified sub-sample of data and computes the mean red, green, blue densities. It then eliminates all data points falling outside ± 3.5 sigma from the mean and recomputes the mean based on the new, reduced sample size. The mean transmittance and transmittance standard deviation are then computed, and the average density corresponding to the mean transmittance is determined.

The mean red, green and blue densities are then compared with previous means and if there is a significant difference in any or all colors, then the past mean, standard deviation, mean transmittance, transmittance standard deviation and sample size are printed out for that color or colors.

The standard program for exposure table generation has been reworked to determine trichromatic exposure tables over a density range from zero to 4.00. These trichromatic exposure tables are generated from analytical densities (cyan, magenta, yellow) rather than from integral densities.

Work has been completed on a characteristic matrix program that finds the roots and characteristic vectors of a 400 x 400 array. This array is generated by first determining the deviations from neutral that exist for any exposure table generated from non-neutral characteristic curves. This array of differences is then multiplied by its transpose to form the 400 x 400 array. The characteristic matrix that results from the program is an integral part of the regeneration of exposure tables for non-neutral images. Three characteristic matrices will have to be generated for each emulsion type.

Color Image Assessment - Experimental Aspects

The three sets of red, blue and green sine waves on unfogged film were completed

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during this period. Some time was spent in circumventing experimental difficulties associated with the use of a He-Ne laser for generating the set of red sine waves. The chief problem was one of nonuniform beam intensity caused by minute imperfections in the optical components interposed between the laser and the film. By rotating each optical component we were able to find an optimum orientation for each component which either eliminated or displaced the nonuniformities toward the edge of the targets. In this fashion it was possible to produce targets having large, traceable areas.

A technique for fogging two dye layers in the emulsion has been tested successfully.

The generation of micro-step wedges continued during the report period although the progress was not as rapid as anticipated. The generation of these wedges on SO-151, SO-155 and 8442 material in cyan, magenta and yellow dyes is approximately 50 percent complete.

WORK PLANNED FOR NEXT PERIOD

1. Computer programming effort will continue.
2. Generation of micro-step wedges will be completed. Scanning of these wedges, at the customer facility, will begin under the previously established conditions, i.e., one sample per 10 microns with a 1 x 80 micron slit.
3. Wedges, exposed by desaturated sources, on SO-151, SO-155 and 8442 material will be generated.
4. Effort will be expended on producing a quality control package.
5. Both the comb and edge target mirrors have been received. If possible, the production of imagery utilizing these targets will be initiated late in August.

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FINANCIAL INFORMATION

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Total amount authorized . . . . . .

Total amount expended through June 30, 1967 . . . . . .

Total amount remaining as of June 30, 1967 . . . . . .

Total man-hours expended through June 30, 1967 . . . . . .

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